

Amendments to Claims

This listing of claims will replace all prior revisions and listings of claims in this application.

Listing of Claims

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1-20. (Cancelled)

21. (Previously Presented) A method comprising:

generating a phase-shift keyed optical signal; and

propagating the phase shift keyed optical signal through a semiconductor optical amplifier in deep saturation, wherein $-4\text{dBm} < P_{\text{IN}} < 4\text{dBm}$ such that an optical signal exhibiting a regulated, -amplified optical power is produced;

wherein the amplified optical power is regulated to a saturation output power such that $\Delta P_{\text{OUT}}(\text{dB})/\Delta P_{\text{IN}}(\text{dB})$ of the optical amplifier is less than 0.25, wherein P_{OUT} is the power of the optical signal output from the amplifier, and P_{IN} is the power of the optical signal input into the amplifier.

22. (Previously Presented) A method for optical limiting amplification comprising:

inputting a phase-shift keyed optical signal having a data independent intensity profile into a semiconductor optical amplifier in a deep saturation regime wherein $-4\text{dBm} < P_{\text{IN}} < 4\text{dBm}$ such that an optical signal exhibiting a regulated, amplified optical power is produced and output, wherein $\Delta P_{\text{OUT}}(\text{dB})/\Delta P_{\text{IN}}(\text{dB})$ is less than 0.25, where P_{OUT} is the power of the optical signal output from the amplifier, and P_{IN} is the power of the optical signal input into the amplifier.

23. (Previously Presented) An optical signal processor apparatus comprising:

a semiconductor optical amplifier device adapted to operate in deep saturation wherein $-4\text{dBm} < P_{\text{IN}} < 4\text{dBm}$ and to receive an RZ-DPSK optical signal having an amplitude-shift

keyed optical label portion, such that the optical label portion of the signal is removed upon propagation through the semiconductor optical amplifier device;

wherein $\Delta P_{OUT}(dB) / \Delta P_{IN}(dB)$ is less than 0.25, where P_{OUT} is the power of the optical signal output from the amplifiers, and P_{IN} is the power of the optical signal input into the amplifiers.

24. **(Previously Presented)** An optical communication system for transmitting multi-channel phase-shift keyed optical signals comprising:

a plurality of semiconductor optical amplifiers,

wherein the system is adapted to transmit the optical signals such that the plurality of semiconductor optical amplifiers operate in a deep saturation regime wherein $-4dBm < P_{IN} < 4dBm$ so as to provide optical power equalization of a plurality of channels of the multi-channel optical signals,

wherein $\Delta P_{OUT}(dB) / \Delta P_{IN}(dB)$ is less than about 0.25, where P_{OUT} is the power of the optical signal output from the amplifiers, and P_{IN} is the power of the optical signal input into the amplifiers.

25. **(Previously Presented)** An apparatus comprising:

a means for generating a phase-shift keyed optical signal; and

a means for propagating the optical signal through a semiconductor optical amplifier in deep saturation wherein $-4dBm < P_{IN} < 4dBm$ to regulate the amplified optical power;

wherein $\Delta P_{OUT}(dB) / \Delta P_{IN}(dB)$ is less than 0.25, where P_{OUT} is the power of the optical signal output from the amplifiers, and P_{IN} is the power of the optical signal input into the amplifiers.